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Report for the State of Maine on the Alignment of the SAT® and PSAT/NMSQT® to the Maine Learning Results

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September 2005

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Overview

The College Board offers this alignment report to provide educational stakeholders in Maine with a description of the alignment between the expectations for student learning articulated in the Maine Learning Results for mathematics and English language arts and the knowledge and skills assessed by the PSAT/NMSQT® and SAT Reasoning Test™.

The PSAT/NMSQT and SAT® measure the critical reading, mathematical reasoning, and writing skills that students have developed over time and that they need to be successful in college. Through curriculum surveys and alignment analyses, the College Board regularly surveys classroom instructional practices, state standards, and district curriculum frameworks for grades 9–12, as well as the course content of first-year college courses, to ensure that its assessments measure the content knowledge and cognitive processes students need to succeed in college. This report provides a detailed description of how closely what is measured by the PSAT/NMSQT and SAT aligns with the expectations defined in the Maine Learning Results, both in terms of content covered and level of cognitive processing expected.

Alignment of Standards and Assessments for Accountability Reporting

According to the No Child Left Behind Act (2001), statewide accountability systems must include an aligned system of academic content standards, academic student achievement standards, and assessments of student performance. A state's academic content standards define the content knowledge, cognitive processes, and skills students should develop in each subject area through their years of schooling. States must also establish at least three academic achievement levels—for example, basic, proficient, or advanced—that describe "how good is good enough" with respect to mastering the content knowledge and skills defined in the academic content standards. Finally, states must administer annual assessments to measure student progress toward proficiency as defined by the achievement levels in reading or language arts and mathematics. Aligning standards and assessments is critical for communicating learning priorities, focusing instruction, and ensuring that students will have had the opportunity to learn the knowledge and skills for which they and their schools will be held accountable.

States are interested in investigating whether the PSAT/NMSQT and SAT are sufficiently aligned to their content standards, academic achievement standards, and assessments to support an integrated approach to assessment and instruction. States investigating whether the PSAT/NMSQT and SAT are sufficiently aligned to justify their use in measuring student progress toward their standards may use this study as a preliminary determination of the degree of that alignment. States are reminded, however, that any significant changes made to their

accountability system, such as the adoption of new assessments, must be submitted to the U.S. Department of Education (ED) for peer review (NCLB, section 1111(f)(2)).

While the PSAT/NMSQT and SAT assess students' ability to reason critically about the content knowledge they have developed in school, each test reports scores in terms of how well each student performs compared with other students who have taken the test. The PSAT/NMSQT and SAT, therefore, provide an independent, standardized measure of student performance that supports comparison and ranking of student performance against a national norm. To interpret student scores on the PSAT/NMSQT or SAT in terms of the state's achievement levels requires a standard-setting process by which content experts, measurement specialists, and other relevant stakeholders identify scores that correspond to performance levels determined by a state.

Methodology

The methodology used to produce this alignment report is modeled after the methodology developed by Norman Webb, Senior Research Scientist at the Wisconsin Center for Education Research, University of Wisconsin-Madison.[1] External alignment specialists were engaged by the College Board to rate the alignment of one test form of the SAT, one test form of the PSAT/NMSQT, and the *PSAT/NMSQT Skills for Critical Reading, Writing, and Mathematics* to the Maine Learning Results. Reviewers included curriculum and assessment specialists in both English language arts and mathematics. The alignment rating process includes two ratings: (1) reviewers rate the depth-of-knowledge (DOK) of both the content standards and the assessment items; and (2) reviewers map individual test items to the lowest level of the state's standards hierarchy to indicate a concurrence between the content described by the standards and the content measured by the test items.[2] Reviewers were not restricted in the number of performance indicators to which they could map a test item. The decision not to restrict the number of mappings was made for two reasons: the PSAT/NMSQT and SAT test items typically call upon multiple skills and content understandings to be answered correctly; and many state standards are not written at a level of specificity such that their performance indicators describe a single, discrete skill or understanding to be assessed.

Training for the depth-of-knowledge ratings included reviewing the descriptions of the four subject-specific, depth-of-knowledge levels published by Dr. Webb. Subject-specific reviewers then reviewed sample performance indicators and test items that had been previously scored by content and assessment experts who served as trainers. Reviewers discussed these ratings, then scored and discussed other sample performance indicators and test items, working with trainers

1. Dr. Webb's methodology is described in detail in a National Institute of Science Education (NISE) research monograph, *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education* (Webb, 1997).
2. As the hierarchy and nomenclature of state standards frameworks vary, we have adopted a generic taxonomy to reference the components of the standards: grade level, subject area, standard, objective, performance indicator.

to develop a consensus norm for depth-of-knowledge ratings in each subject area. Training for the content mappings followed a similar procedure using expert-rated content alignment samples to norm reviewers' judgments.

The subject-specific depth-of-knowledge scales developed by Dr. Webb and used in this analysis are provided in Appendix F.

Alignment Criteria Used for This Analysis

The data generated through the depth-of-knowledge and content alignment ratings are summarized and reported according to four alignment criteria, which are described below. These alignment criteria are those developed by Dr. Webb to provide a summary description of the alignment of assessments to a state's content standards across four dimensions. An acceptable level of alignment for each criterion was set based on a rationale for what would be required to assure that a student had met the standards. The descriptions that follow are summarized from a report published by Dr. Webb on the alignment of the Michigan Academic Content Standards to six assessments (Webb, 2005, quoted with permission).

Categorical Concurrence

An important aspect of alignment between standards and assessments is whether both address the same content categories. The criterion of categorical concurrence between standards and assessments is met if the same or consistent categories of content appear in both documents. This criterion was judged by determining whether the assessment includes items measuring content from each standard. The analysis assumed that the assessment had to have at least six items measuring content from a standard in order for an acceptable level of categorical concurrence to exist between the standard and the assessment. The number of items, six, is based on estimating the number of items that could produce a reasonably reliable subscale for estimating students' mastery of content on that subscale. Of course, many factors must be considered in determining what a reasonable number is, including the reliability of the subscale, the mean score, and the cutoff score for determining mastery. Using a procedure developed by Subkoviak (1988) and assuming that the cutoff score is the mean and that the reliability of one item is .1, it was estimated that six items would produce an agreement coefficient of at least .63. This indicates that about 63 percent of the group would be consistently classified as masters or nonmasters if two equivalent test administrations were employed. The agreement coefficient would increase to .77 if the cutoff score is increased to one standard deviation from the mean, and to .88 with a cutoff score of 1.5 standard deviations from the mean. Usually states do not report student results by standards, or require students to achieve a specified cutoff score on subscales related to a standard. If a state did do this, then the state would seek an agreement coefficient higher than .63. Six items were assumed as a minimum for an assessment measuring content knowledge related

to a standard and as a basis for making some decisions about students' knowledge of that standard.

Depth-of-Knowledge Consistency

Standards and assessments can be aligned not only on the category of content covered by each, but also on the basis of the complexity of knowledge required by each. Depth-of-knowledge consistency between standards and assessments indicates alignment if what is elicited from students on an assessment is as demanding cognitively as what students are expected to know and do as stated in the standards. For consistency to exist between the assessment and the standard, as judged in this analysis, at least 50 percent of the items corresponding to a standard had to be at or above the mean depth-of-knowledge ratings for performance indicators within that standard; 50 percent, a conservative cutoff point, is based on the assumption that a minimal passing score for any one standard of 50 percent or higher would require the student to successfully answer at least some items at or above the depth-of-knowledge level of the corresponding performance indicators. For example, assume an assessment included six items related to one standard and students were required to answer correctly four of those items to be judged proficient—that is, 67 percent of the items. If three of the six items (50 percent) were at or above the depth-of-knowledge level of the corresponding performance indicators, then a student would have to answer correctly at least one item at or above the depth-of-knowledge level of one performance indicator to achieve a proficient score. Some leeway was used in this analysis on this criterion. If a standard had between 40 and 50 percent of the mapped items at or above the depth-of-knowledge levels of the performance indicators, then it was reported that the criterion was "weakly" met.

Range-of-Knowledge Correspondence

For standards and assessments to be aligned, the breadth of knowledge required by both should be comparable. The range-of-knowledge criterion is used to judge whether a span of knowledge expected of students by a standard is the same as, or is comparable to, the span of knowledge that students need in order to correctly answer the assessment items. The criterion for correspondence between range of knowledge for a standard and an assessment considers the number of performance indicators within the standard with at least one related assessment item. In order for the alignment on this criterion to be judged acceptable, 50 percent of the performance indicators for a standard must have at least one related assessment item. This level is based on the assumption that students' knowledge should be tested on content from more than half the domain of knowledge for a standard. This assumes that each performance indicator for a standard should be given equal weight. Depending on the balance in the distribution of items and the necessity for having a low number of items related to any one performance indicator, the requirement that assessment items need to be related to more than 50 percent of the performance indicators for a standard increases the likelihood that students will have to demonstrate

knowledge on more than one performance indicator per standard to achieve a minimal passing score. As with the other criteria, a state may choose to make the acceptable level on this criterion more rigorous by requiring an assessment to include items related to a greater number of the performance indicators. However, any restriction on the number of items included on the test will place an upper limit on the number of performance indicators that can be assessed. Range-of-knowledge correspondence is more difficult to attain if the content expectations are partitioned among a greater number of standards and a large number of performance indicators. For this analysis, if 50 percent or more of the performance indicators for a standard were assessed by at least one test item, then the range-of-knowledge criterion was met. If between 40 and 50 percent of the performance indicators for a standard were assessed by at least one test item, the criterion was "weakly" met.

Balance of Representation

In addition to having comparable depth and breadth of knowledge, standards and assessments that are properly aligned will require that knowledge be distributed equally in both. The *range-of-knowledge* criterion only considers the number of performance indicators within a standard for which there is at least one corresponding test item measuring that performance indicator; it does not take into consideration how the items are distributed among these performance indicators. The *balance-of-representation* criterion is used to indicate the degree to which one performance indicator is given more emphasis on the assessment than another. To represent the balance of representation across performance indicators, an index is calculated to indicate the distribution of assessment items across performance indicators. Because a test item may be judged to measure more than one performance indicator, the balance-of-representation index is calculated in terms of the number of "hits"—that is, the number of mapped pairings between test items and performance indicators. This index only considers those performance indicators within a standard for which there is at least one hit. The index is computed by considering how the distribution of items to performance indicators compares with an even distribution across indicators. An index value of 1 signifies perfect balance and is obtained if the hits related to a standard are equally distributed among the performance indicators for the given standard. Index values that approach 0 signify that a large proportion of the hits are on only one or two of all the performance indicators hit. Depending on the number of performance indicators and the number of hits, a unimodal distribution (most items related to one performance indicator and only one item related to each of the remaining performance indicators) has an index value of less than .5. A bimodal distribution has an index value of around .55 or .6. Index values of .7 or higher indicate that test items are distributed among all the performance indicators at least to some degree (e.g., every performance indicator has at least two items); .7 is used as the acceptable level on this criterion. Index values between .6 and .7 indicate the balance-of-representation criterion has only been "weakly" met.

Findings

No single assessment can fully measure the expectations defined in a state's academic content standards. Even assessments designed by the state specifically to measure the state's content standards will only sample the domain of content knowledge and cognitive processes that educational stakeholders have determined are important to proficient performance in each subject area. The range and balance of coverage provided by an assessment should be evaluated keeping in mind the constraints (e.g., caps on available testing time; costs associated with test development, scoring, and reporting) under which any timed, standardized assessment can be administered. While most states do not report subscores for student performance in a specific standard for accountability purposes, states may be interested in such reports for instructional purposes or for their own program evaluation purposes. Where range and balance of coverage provided by an assessment are insufficient to support reliable inferences about student performance in a particular standard or strand, additional test items may be needed to augment the scope of the domain being tested.

Following are summary tables describing the alignment of the SAT and PSAT/NMSQT to the Maine Learning Results for grades 9–12 in English language arts and mathematics.

Depth-of-Knowledge Ratings of Maine Learning Results

Three reviewers reached consensus on the depth-of-knowledge level for each performance indicator under the state's English language arts standards and mathematics standards. The results from the reviewers' rating of the depth-of-knowledge levels of the performance indicators are presented in Tables 1 and 2.

Overall, the Maine Learning Results for English language arts are demanding. Reviewers rated 51 percent of the performance indicators for grades 9–12 at a depth-of-knowledge level 2 (Basic Reasoning), and 49 percent at level 3 (Complex Reasoning). None of the performance indicators were rated at a level 1 (Recall). All of the performance indicators, therefore, require students to engage in some form of reasoning and drawing of inferences that go beyond the text.

Table 1. Percent of Performance Indicators (PIs) by Depth-of-Knowledge (DOK) Levels for High School: Maine Learning Results for English Language Arts

Percent of Performance Indicators (PIs) by Depth-of-Knowledge (DOK) Levels for High School

Maine Learning Results for English Language Arts

Standard	Number of PIs Under Standard	DOK Levels of PIs	# of PIs by DOK Levels	% of PIs by DOK Levels
A. PROCESS OF READING Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read.	11	2	3	27
		3	8	73
B. LITERATURE AND CULTURE Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture.	11	3	11	100
C. LANGUAGE AND IMAGES Students will demonstrate an understanding of how words and images communicate.	8	3	8	100
D. INFORMATIONAL TEXTS Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum.	6	2	3	50
		3	3	50
E. PROCESSES OF WRITING AND SPEAKING Students will demonstrate the ability to use the skills and strategies of the writing process.	4	2	3	75
		3	1	25
F. STANDARD ENGLISH CONVENTIONS Students will write and speak correctly, using conventions of standard written and spoken English.	7	2	7	100
G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions.	11	2	11	100
H. RESEARCH-RELATED WRITING AND SPEAKING Students will work, write, and speak effectively when doing research in all content areas.	12	2	9	75
		3	3	25
Total PIs Across Standards by DOK	**70**	**2**	**36**	**51**
		3	**34**	**49**

The Maine Learning Results for mathematics are also quite demanding. Reviewers rated 3 percent of the performance indicators for grades 9–12 at a depth-of-knowledge level 1 (Recall), 74 percent at level 2 (Skill/Concept), 19 percent at level 3 (Strategic Thinking), and 3 percent at level 4 (Extended Thinking). The Maine Learning Results for mathematics generally require that students plan and make decisions about how to approach a problem, rather than simply engage in rote computation.

Table 2. Percent of Objectives (Objs.) by Depth-of-Knowledge (DOK) Levels for High School: Maine Learning Results for Mathematics

Percent of Objectives (Objs.) by Depth-of-Knowledge (DOK) Levels for High School

Maine Learning Results for Mathematics

Standard	Number of Objs. Under Standard	DOK Levels of Objs.	# of Objs. by DOK Levels	% of Objs. by DOK Levels
A. NUMBERS AND NUMBER SENSE Students will understand and demonstrate a sense of what numbers mean and how they are used.	2	2	2	100
B. COMPUTATION Students will understand and demonstrate computation skills.	2	2	1	50
		3	1	50
C. DATA ANALYSIS AND STATISTICS Students will understand and apply concepts of data analysis.	5	1	1	20
		2	2	40
		3	1	20
		4	1	20
D. PROBABILITY Students will understand and apply concepts of probability.	2	2	2	100
E. GEOMETRY Students will understand and apply concepts from geometry.	3	2	2	67
		3	1	33
F. MEASUREMENT Students will understand and demonstrate measurement skills.	2	2	2	100
G. PATTERNS, RELATIONS, FUNCTIONS Students will understand that mathematics is the science of patterns, relationships, and functions.	4	2	4	100
H. ALGEBRA CONCEPTS Students will understand and apply algebraic concepts.	4	2	4	100
I. DISCRETE MATHEMATICS Students will understand and apply concepts in discrete mathematics.	4	2	4	100
J. MATHEMATICAL REASONING Students will understand and apply concepts of mathematical reasoning.	1	3	1	100
K. MATHEMATICAL COMMUNICATION Students will reflect upon and clarify their understanding of mathematical ideas and relationships.	2	3	2	100
Total Objs. Across Standards by DOK	**31**	**1**	**1**	**3**
		2	**23**	**74**
		3	**6**	**19**
		4	**1**	**3**

SAT® English Language Arts Alignment

The results of the analysis of the alignment between the SAT and the Maine Learning Results for English language arts are outlined in Table 3. Detailed data supporting each of the criteria evaluations are provided in Appendix A. In Table 3, "Yes" indicates that an acceptable level of alignment was attained between the assessment and the standard on the criterion. "Weak" indicates that the criterion was nearly met, within a margin that could simply be due to error in the system. "No" indicates that the criterion was not met by a noticeable margin—10 percent under an acceptable level for depth-of-knowledge consistency, 10 percent under an acceptable level for range-of-knowledge correspondence, and .1 under an index value of .7 for balance of representation.

Table 3. Summary of Acceptable Levels of Alignment Between the SAT and the Maine Learning Results for English Language Arts by Four Criteria

Alignment of SAT to Maine Learning Results for English Language Arts

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
A. PROCESS OF READING Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read.	Yes	Yes	Yes	Weak
B. LITERATURE AND CULTURE Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture.	Yes	Yes	Yes	Weak
C. LANGUAGE AND IMAGES Students will demonstrate an understanding of how words and images communicate.	Yes	Yes	No	Yes
D. INFORMATIONAL TEXTS Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum.	Yes	Yes	No	Yes
E. PROCESSES OF WRITING AND SPEAKING Students will demonstrate the ability to use the skills and strategies of the writing process.	No	No	No	No
F. STANDARD ENGLISH CONVENTIONS Students will write and speak correctly, using conventions of standard written and spoken English.	Yes	Yes	Yes	No
G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions.	Yes	Yes	Yes	Weak
H. RESEARCH-RELATED WRITING AND SPEAKING Students will work, write, and speak effectively when doing research in all content areas.	No	No	No	No

PSAT/NMSQT® English Language Arts Alignment

The results of the analysis of the alignment between the PSAT/NMSQT and the Maine Learning Results for English language arts are outlined in Table 4. Detailed data supporting each of the criteria evaluations are provided in Appendix B. In Table 4, "Yes" indicates that an acceptable level of alignment was attained between the assessment and the standard on the criterion. "Weak" indicates that the criterion was nearly met, within a margin that could simply be due to error in the system. "No" indicates that the criterion was not met by a noticeable margin—10 percent under an acceptable level for depth-of-knowledge consistency, 10 percent under an acceptable level for range-of-knowledge correspondence, and .1 under an index value of .7 for balance of representation.

Table 4. Summary of Acceptable Levels of Alignment Between the PSAT/NMSQT and the Maine Learning Results for English Language Arts by Four Criteria

Alignment of PSAT/NMSQT to Maine Learning Results for English Language Arts

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
A. PROCESS OF READING Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read.	Yes	Yes	Yes	Yes
B. LITERATURE AND CULTURE Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture.	Yes	Yes	Yes	Weak
C. LANGUAGE AND IMAGES Students will demonstrate an understanding of how words and images communicate.	No	Yes	No	Yes
D. INFORMATIONAL TEXTS Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum.	Yes	Yes	No	Yes
E. PROCESSES OF WRITING AND SPEAKING Students will demonstrate the ability to use the skills and strategies of the writing process.	No	Yes	No	Yes
F. STANDARD ENGLISH CONVENTIONS Students will write and speak correctly, using conventions of standard written and spoken English.	Yes	Weak	Yes	Yes
G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions.	No	No	No	No
H. RESEARCH-RELATED WRITING AND SPEAKING Students will work, write, and speak effectively when doing research in all content areas.	No	No	No	No

SAT Mathematics Alignment

The results of the analysis of the alignment between the SAT and the Maine Learning Results for mathematics are outlined in Table 5. Detailed data supporting each of the criteria evaluations are provided in Appendix C. In Table 5, "Yes" indicates that an acceptable level of alignment was attained between the assessment and the standard on the criterion. "Weak" indicates that the criterion was nearly met, within a margin that could simply be due to error in the system. "No" indicates that the criterion was not met by a noticeable margin—10 percent under an acceptable level for depth-of-knowledge consistency, 10 percent under an acceptable level for range-of-knowledge correspondence, and .1 under an index value of .7 for balance of representation.

Table 5. Summary of Acceptable Levels of Alignment Between the SAT and the Maine Learning Results for Mathematics by Four Criteria

Alignment of SAT to Maine Learning Results for Mathematics

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
A. NUMBERS AND NUMBER SENSE Students will understand and demonstrate a sense of what numbers mean and how they are used.	Yes	Yes	Weak	Yes
B. COMPUTATION Students will understand and demonstrate computation skills.	Yes	Yes	Weak	Yes
C. DATA ANALYSIS AND STATISTICS Students will understand and apply concepts of data analysis.	No	Yes	No	Yes
D. PROBABILITY Students will understand and apply concepts of probability.	No	Yes	Weak	Yes
E. GEOMETRY Students will understand and apply concepts from geometry.	Yes	Yes	Yes	Yes
F. MEASUREMENT Students will understand and demonstrate measurement skills.	No	Yes	Yes	Yes
G. PATTERNS, RELATIONS, FUNCTIONS Students will understand that mathematics is the science of patterns, relationships, and functions.	Yes	Yes	Yes	Yes
H. ALGEBRA CONCEPTS Students will understand and apply algebraic concepts. Students will be able to:	Yes	Yes	Yes	Yes
I. DISCRETE MATHEMATICS Students will understand and apply concepts in discrete mathematics.	No	Yes	Yes	Yes
J. MATHEMATICAL REASONING Students will understand and apply concepts of mathematical reasoning.	No	Yes	Yes	Yes
K. MATHEMATICAL COMMUNICATION Students will reflect upon and clarify their understanding of mathematical ideas and relationships.	Yes	Yes	Weak	Yes

PSAT/NMSQT Mathematics Alignment

The results of the analysis of the alignment between the PSAT/NMSQT and the Maine Learning Results for mathematics are outlined in Table 6. Detailed data supporting each of the criteria evaluations are provided in Appendix D. In Table 6, "Yes" indicates that an acceptable level of alignment was attained between the assessment and the standard on the criterion. "Weak" indicates that the criterion was nearly met, within a margin that could simply be due to error in the system. "No" indicates that the criterion was not met by a noticeable margin—10 percent under an acceptable level for depth-of-knowledge consistency, 10 percent under an acceptable level for range-of-knowledge correspondence, and .1 under an index value of .7 for balance of representation.

Table 6. Summary of Acceptable Levels of Alignment Between the PSAT/NMSQT and the Maine Learning Results for Mathematics by Four Criteria

Alignment of PSAT/NMSQT to Maine Learning Results for Mathematics

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
A. NUMBERS AND NUMBER SENSE Students will understand and demonstrate a sense of what numbers mean and how they are used.	No	Yes	Weak	Yes
B. COMPUTATION Students will understand and demonstrate computation skills.	Yes	Weak	Weak	Yes
C. DATA ANALYSIS AND STATISTICS Students will understand and apply concepts of data analysis.	No	Yes	Yes	Yes
D. PROBABILITY Students will understand and apply concepts of probability.	No	Yes	Weak	Yes
E. GEOMETRY Students will understand and apply concepts from geometry.	Yes	Yes	Yes	Yes
F. MEASUREMENT Students will understand and demonstrate measurement skills.	Yes	Yes	Yes	Yes
G. PATTERNS, RELATIONS, FUNCTIONS Students will understand that mathematics is the science of patterns, relationships, and functions.	Yes	Yes	Yes	Yes
H. ALGEBRA CONCEPTS Students will understand and apply algebraic concepts.	Yes	Yes	Yes	Yes
I. DISCRETE MATHEMATICS Students will understand and apply concepts in discrete mathematics.	No	Yes	Weak	Yes
J. MATHEMATICAL REASONING Students will understand and apply concepts of mathematical reasoning.	No	No	Yes	Yes
K. MATHEMATICAL COMMUNICATION Students will reflect upon and clarify their understanding of mathematical ideas and relationships.	Yes	Weak	Weak	Yes

PSAT/NMSQT Skills Alignment

In addition to analyzing a specific form of the PSAT/NMSQT, reviewers rated the alignment of the PSAT/NMSQT Skills to the Maine Learning Results for English language arts and mathematics. The PSAT/NMSQT Skills and Suggestions for How to Improve are included in the PSAT/NMSQT Score Report *Plus* that each student receives after taking the PSAT/NMSQT. For

each administration of the PSAT/NMSQT, specific test items are mapped to the PSAT/NMSQT Skills for critical reading, writing, and mathematics; this mapping forms the basis for providing individualized feedback to students based on their pattern of responses across questions. The alignment mapping of the PSAT/NMSQT Skills to the Maine Learning Results is included in Appendix E.

Summary

This report provides a detailed description of how closely what is measured by the PSAT/NMSQT and SAT aligns with the expectations defined in the Maine Learning Results, both in terms of content covered and level of cognitive processing expected. States investigating whether the PSAT/NMSQT and SAT are sufficiently aligned to justify their use in measuring student progress toward their standards may use this study as a preliminary determination of the degree of that alignment. States are reminded, however, that any significant changes made to their accountability system, such as the adoption of new assessments, must be submitted to the U.S. Department of Education (ED) for peer review.

The alignment of the SAT to the Maine Learning Results for English language arts is strongest for standards in Process of Reading, Literature and Culture, Language and Images, Informational Texts, Standard English Conventions, and Stylistic and Rhetorical Aspects of Writing and Speaking. Standards for Processes of Writing and Speaking and for Research-Related Writing and Speaking are not adequately covered to meet the Categorical Concurrence alignment criterion. A careful review of Appendix A would suggest the number and type of additional items that would be needed to augment the SAT to achieve satisfactory alignment for these standards.

The alignment of the PSAT/NMSQT to the Maine Learning Results for English language arts is similar to that of the SAT. The alignment is strongest for standards in Process of Reading, Literature and Culture, Informational Texts, and Standard English Conventions. Standards for Language and Images, Processes of Writing and Speaking, Stylistic and Rhetorical Aspects of Writing and Speaking, and Research-Related Writing and Speaking are not adequately covered to meet the Categorical Concurrence alignment criterion. A careful review of Appendix B would suggest the number and type of additional items that would be needed to augment the PSAT/NMSQT to achieve satisfactory alignment for these standards.

The alignment of the SAT to the Maine Learning Results for mathematics is strongest for standards in Numbers and Number Sense; Computation; Geometry; Patterns, Relations, Functions; Algebra Concepts; and Mathematical Communication. Standards for Data Analysis and Statistics, Probability, Measurement, Discrete Mathematics, and Mathematical Reasoning are not adequately covered to meet the Categorical Concurrence alignment criterion. A careful review of Appendix C would suggest the number and type of additional items that would be needed to augment the SAT to achieve satisfactory alignment for these standards.

The alignment of the PSAT/NMSQT to the Maine Learning Results for mathematics is strongest for standards in Computation; Geometry; Measurement; Patterns, Relations, Functions; Algebra Concepts; and Mathematical Communication. Standards for Numbers and Number Sense, Data Analysis and Statistics, Probability, Discrete Mathematics, and Mathematical Reasoning are not adequately covered to meet the Categorical Concurrence alignment criterion. A careful review of Appendix D would suggest the number and type of additional items that would be needed to augment the PSAT/NMSQT to achieve satisfactory alignment for these standards.

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Appendix A:

Categorical and Depth-of-Knowledge Alignment Ratings: SAT to Maine Learning Results for English Language Arts

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
Secondary Grades	A. PROCESS OF READING Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read. Students will be able to:	1. Demonstrate an understanding that reading is a gradual process of constructing meaning and revising initial understandings.		A.9-12.1	3.0	2.6	47
		2. Demonstrate an understanding that a single text will elicit a wide variety of responses, each of which may be the point of view of the individual reader or listener.		A.9-12.2	3.0		0
		3. Identify the author's purpose and analyze the effects of that purpose on the text.		A.9-12.3	3.0	2.8	4
		4. Identify the author's point of view and analyze the effects of that point of view on the text.		A.9-12.4	3.0	3.0	9
		5. Identify the devices an author uses to persuade readers and critique the effectiveness of the use of those devices.		A.9-12.5	3.0	2.8	6
		6. Use the context of a work to determine the figurative, idiomatic, and technical meanings of terms.		A.9-12.6	2.0	1.7	15
		7. Use the context of a work to determine the meanings of abbreviations and acronyms.		A.9-12.7	2.0		0
		8. Find the meaning of relatively uncommon technical terms used in informational texts.		A.9-12.8	2.0		0
		9. Identify the philosophical assumptions and basic beliefs underlying a particular text.		A.9-12.9	3.0	2.9	11
		10. Analyze how the cultural context of a literary work is evident in the text.		A.9-12.10	3.0	2.9	7
		11. Represent key ideas and supporting details in various written forms (e.g., outline, paraphrase, concise summary).		A.9-12.11	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.7**	**2.6**	**99**
	B. LITERATURE AND CULTURE Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture. Students will be able to:	1. Distinguish between the purpose of a literary work and the personal response of an individual reader.		B.9-12.1	3.0		0
		2. Identify the simple and complex actions and interactions involving main and subordinate characters in a work.		B.9-12.2	3.0	3.0	5
		3. Make abstract connections (e.g., connections about thoughts, ideas, values) between their own lives and the characters, events, and circumstances represented in various works.		B.9-12.3	3.0	3.0	4
		4. Demonstrate an understanding of the stylistic effect of dialogues on the style of a work.		B.9-12.4	3.0		0
		5. Identify and analyze the details and effects of complex literary devices on the overall quality of a work (e.g., foreshadowing, flashbacks, time frames in the future or past).		B.9-12.5	3.0	3.0	2

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		6. Identify and analyze how complex elements of plot (e.g., setting, major events, problems, conflicts, resolutions) effect the overall quality of a work.		B.9-12.6	3.0	2.8	12
		7. Apply mature strategies to the reading and interpretation of lengthy adult level fiction, (e.g., satires, parodies, plays, poems, novels) using texts that are complex in terms of character, plot, theme, structure, and dialogue and sophisticated in style, point of view, and use of literary devices.		B.9-12.7	3.0	2.8	12
		8. Apply mature strategies to the reading and interpretation of lengthy adult level nonfiction texts with appropriate complexity of content and sophistication of style.		B.9-12.8	3.0	2.5	38
		9. Demonstrate an understanding of the defining features and structure of literary texts encountered at this level.		B.9-12.9	3.0	2.9	8
		10. Draw from a broad base of knowledge about literature of the United States and the world to examine and critique how print and visual texts explore the human experience and condition.		B.9-12.10	3.0	2.8	12
		11. Examine, evaluate, and elaborate on universal themes in literature, using reading and viewing to explain how themes are developed and achieved.		B.9-12.11	3.0	3.0	3
		Average DOK Ratings and Total Hits for Standard			**3.0**	**2.7**	**96**
	C. LANGUAGE AND IMAGES Students will demonstrate an understanding of how words and images communicate. Students will be able to:	1. Demonstrate an understanding of the relationship among perception, thought, and language.		C.9-12.1	3.0		0
		2. Demonstrate an understanding of how language considerations and representations involving gender affect communication.		C.9-12.2	3.0		0
		3. Compare the ways various social, occupational, and cultural groups use language, and comment on the impact of language use on the way people are viewed and treated.		C.9-12.3	3.0		0
		4. Compare form, meaning, and value of different kinds of symbol systems (e.g., religious symbols, holiday symbols, the symbolism of particular types of architecture).		C.9-12.4	3.0		0
		5. Demonstrate understanding of the history of and changes in the English language by explaining examples.		C.9-12.5	3.0		0
		6. Use dictionaries, handbooks, and other language-related resources to evaluate the accuracy of their use of English.		C.9-12.6	3.0		0
		7. Demonstrate an understanding of the political implications of different forms of language.		C.9-12.7	3.0	2.5	4
		8. Identify propaganda techniques used by writers and speakers.		C.9-12.8	3.0	2.7	9

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		Average DOK Ratings and Total Hits for Standard			**3.0**	**2.6**	**13**
	D. INFORMATIONAL TEXTS Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum. Students will be able to:	1. Scan a passage to determine whether a text contains relevant information.		D.9-12.1	2.0		0
		2. Distinguish between apparent fact and opinion in nonfiction texts.		D.9-12.2	2.0		0
		3. Use discussions with peers as a way of understanding information.		D.9-12.3	2.0		0
		4. Identify complex structures in informational texts and the relationships between the concepts and details in those structures using texts from various disciplines.		D.9-12.4	3.0	2.9	20
		5. Analyze and synthesize the concepts and details in informational texts.		D.9-12.5	3.0	2.5	33
		6. Explain how new information from a text changes personal knowledge.		D.9-12.6	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.5**	**2.7**	**53**
	E. PROCESSES OF WRITING AND SPEAKING Students will demonstrate the ability to use the skills and strategies of the writing process. Students will be able to:	1. Ask pertinent questions during writing conferences and when working alone, using knowledge of personal writing strategies, strengths, and weaknesses to improve one's own writing.		E.9-12.1	2.0		0
		2. Reflect on, evaluate, revise, and edit a sequence of drafts to improve and polish finished work.		E.9-12.2	2.0		0
		3. Use planning, drafting, and revising to produce, on demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.		E.9-12.3	2.0		0
		4. Evaluate the remarks and oral presentations of others to find the key ideas, and explain the ways in which these ideas were developed.		E.9-12.4	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.3**		**0**
	F. STANDARD ENGLISH CONVENTIONS Students will write and speak correctly, using conventions of standard written and spoken English. Students will be able to:	1. Edit written work for standard English spelling and usage, evidenced by pieces that show and contain:	a. no significant errors in the use of pronouns, nouns, adjectival and adverbial forms	F.9-12.1.a	2.0	1.5	17
			b. coordinating and subordinating conjunctions.	F.9-12.1.b	2.0	1.5	4
			c. no significant errors in the spelling of frequently used words and the correct use of commonly confused terms.	F.9-12.1.c	2.0	2.0	1
			d. no significant errors in the common conventions of capitalization and ending punctuation marks and common uses of the comma.	F.9-12.1.d	2.0	2.0	1

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
			e. few significant errors in the spelling of commonly misspelled and rare words, the less common capitalization conventions, the colon, semicolon, hyphen, dash, apostrophe, quotation marks, italics, marginal notes, and footnotes.	F.9-12.1.e	2.0	2.0	2
		2. Demonstrate how language usage may depend on the situation.		F.9-12.2	2.0	2.0	1
		3. Demonstrate command of the conventions involved in a formal speech, effectively engaging peers during presentation and fielding responses afterwards.		F.9-12.3	2.0		0
		Average DOK Ratings and Total Hits for Standard			**2.0**	**1.6**	**26**
	G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions. Students will be able to:	1. Write stories that effectively develop such elements as setting, major events, problems and solutions.		G.9-12.1	2.0		0
		2. Write pieces and deliver oral presentations that effectively use descriptive language to clarify, enhance, and develop ideas.		G.9-12.2	2.0	2.0	1
		3. Write pieces and deliver oral presentations that include a variety of sentence structures and lengths.		G.9-12.3	2.0	2.0	1
		4. Write pieces and deliver oral presentations that are targeted for various audiences (e.g., informed or uninformed, sympathetic or hostile).		G.9-12.4	2.0	2.0	1
		5. Write pieces and deliver oral presentations that achieve distinct purposes (e.g., to persuade, evaluate analyze, defend).		G.9-12.5	2.0	2.0	1
		6. Write and deliver oral presentations that effectively employ explicit transitional devices in order to change a situation or to move the reader/listener through the piece.		G.9-12.6	2.0	2.0	7
		7. Write pieces and deliver oral presentations in which the organization of the work follows from the purpose.		G.9-12.7	2.0	2.0	1
		8. Write pieces and deliver oral presentations in a personal style, with a discernible voice and effective wording.		G.9-12.8	2.0	2.0	1
		9. Write essays and deliver oral presentations that reliably support and provide details for the explicitly stated generalizations.		G.9-12.9	2.0	2.0	1
		10. Make effective use of a variety of techniques to provide supporting detail (e.g., analogies, anecdotes, illustrations, detailed descriptions, restatements, paraphrases, examples, comparisons) in written work and oral presentations.		G.9-12.10	2.0	2.0	1

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		11. Make effective use of a variety fo techniques for introducing and representing ideas and insights in written work and oral presentations.		G.9-12.11	2.0	2.0	1
		Average DOK Ratings and Total Hits for Standard			**2.0**	**2.0**	**16**
	H. RESEARCH-RELATED WRITING AND SPEAKING Students will work, write, and speak effectively when doing research in all content areas. Students will be able to:	1. Develop an appropriate strategy for finding information on a particular topic.		H.9-12.1	2.0		0
		2. Use referencing while doing research.		H.9-12.2	2.0		0
		3. Record significant information from events attended and interviews conducted.		H.9-12.3	2.0		0
		4. Identify and use library information services.		H.9-12.4	2.0		0
		5. Use government publications, in-depth field studies, and almanacs for research.		H.9-12.5	2.0		0
		6. Use CD-ROM, microfiche, and similar resource media for research.		H.9-12.6	2.0		0
		7. Identify and use a variety of news sources (e.g., newspapers, magazines, broadcast and recorded media, artifacts), informants, and other likely sources for research purposes.		H.9-12.7	2.0		0
		8. Use search engines and other Internet resources to do research.		H.9-12.8	2.0		0
		9. Make extensive use of primary sources when researching a topic and carefully evaluate the motives and perspectives of the authors.		H.9-12.9	3.0		0
		10. Analyze the validity and weigh the reliability of primary information sources and make appropriate use of such information for research purposes.		H.9-12.10	3.0		0
		11. Evaluate information for accuracy, currency, and possible bias.		H.9-12.11	3.0		0
		12. Report orally, using a variety of technological resources to present the results of a research project.		H.9-12.12	2.0		0
		Average DOK Ratings and Total Hits for Standard			**2.3**		**0**
	Average DOK Ratings and Total Hits for Grade Levels				**2.5**	**2.5**	**303**

Appendix B:

Categorical and Depth-of-Knowledge Alignment Ratings: PSAT/NMSQT to Maine Learning Results for English Language Arts

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
Secondary Grades	A. PROCESS OF READING Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read. Students will be able to:	1. Demonstrate an understanding that reading is a gradual process of constructing meaning and revising initial understandings.		A.9-12.1	3.0	2.3	48
		2. Demonstrate an understanding that a single text will elicit a wide variety of responses, each of which may be the point of view of the individual reader or listener.		A.9-12.2	3.0		0
		3. Identify the author's purpose and analyze the effects of that purpose on the text.		A.9-12.3	3.0	2.8	17
		4. Identify the author's point of view and analyze the effects of that point of view on the text.		A.9-12.4	3.0	2.8	17
		5. Identify the devices an author uses to persuade readers and critique the effectiveness of the use of those devices.		A.9-12.5	3.0	2.3	3
		6. Use the context of a work to determine the figurative, idiomatic, and technical meanings of terms.		A.9-12.6	2.0	2.0	9
		7. Use the context of a work to determine the meanings of abbreviations and acronyms.		A.9-12.7	2.0		0
		8. Find the meaning of relatively uncommon technical terms used in informational texts.		A.9-12.8	2.0		0
		9. Identify the philosophical assumptions and basic beliefs underlying a particular text.		A.9-12.9	3.0	2.8	17
		10. Analyze how the cultural context of a literary work is evident in the text.		A.9-12.10	3.0	2.5	4
		11. Represent key ideas and supporting details in various written forms (e.g., outline, paraphrase, concise summary).		A.9-12.11	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.7**	**2.5**	**115**
	B. LITERATURE AND CULTURE Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture. Students will be able to:	1. Distinguish between the purpose of a literary work and the personal response of an individual reader.		B.9-12.1	3.0		0
		2. Identify the simple and complex actions and interactions involving main and subordinate characters in a work.		B.9-12.2	3.0	2.8	5
		3. Make abstract connections (e.g., connections about thoughts, ideas, values) between their own lives and the characters, events, and circumstances represented in various works.		B.9-12.3	3.0	2.5	2
		4. Demonstrate an understanding of the stylistic effect of dialogues on the style of a work.		B.9-12.4	3.0		0
		5. Identify and analyze the details and effects of complex literary devices on the overall quality of a work (e.g., foreshadowing, flashbacks, time frames in the future or past).		B.9-12.5	3.0		0

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		6. Identify and analyze how complex elements of plot (e.g., setting, major events, problems, conflicts, resolutions) effect the overall quality of a work.		B.9-12.6	3.0	2.8	6
		7. Apply mature strategies to the reading and interpretation of lengthy adult level fiction, (e.g., satires, parodies, plays, poems, novels) using texts that are complex in terms of character, plot, theme, structure, and dialogue and sophisticated in style, point of view, and use of literary devices.		B.9-12.7	3.0	2.8	6
		8. Apply mature strategies to the reading and interpretation of lengthy adult level nonfiction texts with appropriate complexity of content and sophistication of style.		B.9-12.8	3.0	2.5	29
		9. Demonstrate an understanding of the defining features and structure of literary texts encountered at this level.		B.9-12.9	3.0	2.7	7
		10. Draw from a broad base of knowledge about literature of the United States and the world to examine and critique how print and visual texts explore the human experience and condition.		B.9-12.10	3.0	2.8	6
		11. Examine, evaluate, and elaborate on universal themes in literature, using reading and viewing to explain how themes are developed and achieved.		B.9-12.11	3.0	3.0	1
		Average DOK Ratings and Total Hits for Standard			**3.0**	**2.7**	**62**
	C. LANGUAGE AND IMAGES Students will demonstrate an understanding of how words and images communicate. Students will be able to:	1. Demonstrate an understanding of the relationship among perception, thought, and language.		C.9-12.1	3.0		0
		2. Demonstrate an understanding of how language considerations and representations involving gender affect communication.		C.9-12.2	3.0		0
		3. Compare the ways various social, occupational, and cultural groups use language, and comment on the impact of language use on the way people are viewed and treated.		C.9-12.3	3.0		0
		4. Compare form, meaning, and value of different kinds of symbol systems (e.g., religious symbols, holiday symbols, the symbolism of particular types of architecture).		C.9-12.4	3.0		0
		5. Demonstrate understanding of the history of and changes in the English language by explaining examples.		C.9-12.5	3.0		0
		6. Use dictionaries, handbooks, and other language-related resources to evaluate the accuracy of their use of English.		C.9-12.6	2.0		0
		7. Demonstrate an understanding of the political implications of different forms of language.		C.9-12.7	3.0	3.0	1
		8. Identify propaganda techniques used by writers and speakers.		C.9-12.8	3.0	2.5	4

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		Average DOK Ratings and Total Hits for Standard			**2.9**	**2.6**	**5**
	D. INFORMATIONAL TEXTS Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum. Students will be able to:	1. Scan a passage to determine whether a text contains relevant information.		D.9-12.1	2.0		0
		2. Distinguish between apparent fact and opinion in nonfiction texts.		D.9-12.2	2.0		0
		3. Use discussions with peers as a way of understanding information.		D.9-12.3	2.0		0
		4. Identify complex structures in informational texts and the relationships between the concepts and details in those structures using texts from various disciplines.		D.9-12.4	3.0	2.8	14
		5. Analyze and synthesize the concepts and details in informational texts.		D.9-12.5	3.0	2.8	24
		6. Explain how new information from a text changes personal knowledge.		D.9-12.6	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.5**	**2.8**	**38**
	E. PROCESSES OF WRITING AND SPEAKING Students will demonstrate the ability to use the skills and strategies of the writing process. Students will be able to:	1. Ask pertinent questions during writing conferences and when working alone, using knowledge of personal writing strategies, strengths, and weaknesses to improve one's own writing.		E.9-12.1	2.0		0
		2. Reflect on, evaluate, revise, and edit a sequence of drafts to improve and polish finished work.		E.9-12.2	2.0		0
		3. Use planning, drafting, and revising to produce, on demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.		E.9-12.3	2.0	1.8	5
		4. Evaluate the remarks and oral presentations of others to find the key ideas, and explain the ways in which these ideas were developed.		E.9-12.4	3.0		0
		Average DOK Ratings and Total Hits for Standard			**2.3**	**1.8**	**5**
	F. STANDARD ENGLISH CONVENTIONS Students will write and speak correctly, using conventions of standard written and spoken English. Students will be able to:	1. Edit written work for standard English spelling and usage, evidenced by pieces that show and contain:	a. no significant errors in the use of pronouns, nouns, adjectival and adverbial forms	F.9-12.1.a	2.0	1.5	12
			b. coordinating and subordinating conjunctions.	F.9-12.1.b	2.0	1.5	2
			c. no significant errors in the spelling of frequently used words and the correct use of commonly confused terms.	F.9-12.1.c	2.0	1.0	1
			d. no significant errors in the common conventions of capitalization and ending punctuation marks and common uses of the comma.	F.9-12.1.d	2.0		0

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
			e. few significant errors in the spelling of commonly misspelled and rare words, the less common capitalization conventions, the colon, semicolon, hyphen, dash, apostrophe, quotation marks, italics, marginal notes, and footnotes.	F.9-12.1.e	2.0	1.0	1
		2. Demonstrate how language usage may depend on the situation.		F.9-12.2	2.0		0
		3. Demonstrate command of the conventions involved in a formal speech, effectively engaging peers during presentation and fielding responses afterwards.		F.9-12.3	2.0		0
		Average DOK Ratings and Total Hits for Standard			**2.0**	**1.4**	**16**
	G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions. Students will be able to:	1. Write stories that effectively develop such elements as setting, major events, problems and solutions.		G.9-12.1	2.0		0
		2. Write pieces and deliver oral presentations that effectively use descriptive language to clarify, enhance, and develop ideas.		G.9-12.2	2.0		0
		3. Write pieces and deliver oral presentations that include a variety of sentence structures and lengths.		G.9-12.3	2.0		0
		4. Write pieces and deliver oral presentations that are targeted for various audiences (e.g., informed or uninformed, sympathetic or hostile).		G.9-12.4	2.0		0
		5. Write pieces and deliver oral presentations that achieve distinct purposes (e.g., to persuade, evaluate analyze, defend).		G.9-12.5	2.0		0
		6. Write and deliver oral presentations that effectively employ explicit transitional devices in order to change a situation or to move the reader/listener through the piece.		G.9-12.6	2.0		0
		7. Write pieces and deliver oral presentations in which the organization of the work follows from the purpose.		G.9-12.7	2.0		0
		8. Write pieces and deliver oral presentations in a personal style, with a discernible voice and effective wording.		G.9-12.8	2.0		0
		9. Write essays and deliver oral presentations that reliably support and provide details for the explicitly stated generalizations.		G.9-12.9	2.0		0
		10. Make effective use of a variety of techniques to provide supporting detail (e.g., analogies, anecdotes, illustrations, detailed descriptions, restatements, paraphrases, examples, comparisons) in written work and oral presentations.		G.9-12.10	2.0		0

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for English Language Arts

Grade	Standard	Objective	Performance Indicator	PI ID	PI DOK	Average Item DOK	Total Hits
		11. Make effective use of a variety fo techniques for introducing and representing ideas and insights in written work and oral presentations.		G.9-12.11	2.0		0
		Average DOK Ratings and Total Hits for Standard			**2.0**		**0**
	H. RESEARCH-RELATED WRITING AND SPEAKING Students will work, write, and speak effectively when doing research in all content areas. Students will be able to:	1. Develop an appropriate strategy for finding information on a particular topic.		H.9-12.1	2.0		0
		2. Use referencing while doing research.		H.9-12.2	2.0		0
		3. Record significant information from events attended and interviews conducted.		H.9-12.3	2.0		0
		4. Identify and use library information services.		H.9-12.4	2.0		0
		5. Use government publications, in-depth field studies, and almanacs for research.		H.9-12.5	2.0		0
		6. Use CD-ROM, microfiche, and similar resource media for research.		H.9-12.6	2.0		0
		7. Identify and use a variety of news sources (e.g., newspapers, magazines, broadcast and recorded media, artifacts), informants, and other likely sources for research purposes.		H.9-12.7	2.0		0
		8. Use search engines and other Internet resources to do research.		H.9-12.8	2.0		0
		9. Make extensive use of primary sources when researching a topic and carefully evaluate the motives and perspectives of the authors.		H.9-12.9	3.0		0
		10. Analyze the validity and weigh the reliability of primary information sources and make appropriate use of such information for research purposes.		H.9-12.10	3.0		0
		11. Evaluate information for accuracy, currency, and possible bias.		H.9-12.11	3.0		0
		12. Report orally, using a variety of technological resources to present the results of a research project.		H.9-12.12	2.0		0
		Average DOK Ratings and Total Hits for Standard			**2.3**		**0**
	Average DOK Ratings and Total Hits for Grade Levels				**2.5**	**2.5**	**241**

Appendix C:

Categorical and Depth-of-Knowledge Alignment Ratings: SAT to Maine Learning Results for Mathematics

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
Secondary Grades	A. NUMBERS AND NUMBER SENSE Students will understand and demonstrate a sense of what numbers mean and how they are used. Students will be able to:	1. Describe the structure of the real number system and identify its appropriate applications and limitations.	A.9-12.1	2.0	2.5	6
		2. Explain what complex numbers (real and imaginary) mean and describe some of their many uses.	A.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.5**	**6**
	B. COMPUTATION Students will understand and demonstrate computation skills. Students will be able to:	1. Use various techniques to approximate solutions, determine the reasonableness of answers, and justify the results.	B.9-12.1	3.0	2.8	12
		2. Explain operations with number systems other than base ten.	B.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.5**	**2.8**	**12**
	C. DATA ANALYSIS AND STATISTICS Students will understand and apply concepts of data analysis. Students will be able to:	1. Determine and evaluate the effect of variables on the results of data collection.	C.9-12.1	3.0	3.0	1
		2. Predict and draw conclusions from charts, tables, and graphs that summarize data from practical situations.	C.9-12.2	2.0	2.0	2
		3. Demonstrate an understanding of concepts of standard deviation and correlation and how they relate to data analysis.	C.9-12.3	2.0		0
		4. Demonstrate an understanding of the idea of random sampling and recognition of its role in statistical claims and designs for data collection.	C.9-12.4	1.0		0
		5. Revise studies to improve their validity (e.g., in terms of better sampling, better controls, or better data analysis techniques).	C.9-12.5	4.0		0
		Average DOK Ratings and Total Hits for Standard		**2.4**	**2.3**	**3**
	D. PROBABILITY Students will understand and apply concepts of probability. Students will be able to:	1. Find probability of compound events and make predictions by applying probability theory.	D.9-12.1	2.0	2.0	1
		2. Create and interpret probability distributions.	D.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.0**	**1**
	E. GEOMETRY Students will understand and apply concepts from geometry. Students will be able to:	1. Draw coordinate representations of geometric figures and their transformations.	E.9-12.1	2.0	2.7	3
		2. Use inductive and deductive reasoning to explore and determine the properties of and relationships among geometric figures.	E.9-12.2	3.0	3.0	5

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
		3. Apply trigonometry to problem situations involving triangles and periodic phenomena.	E.9-12.3	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.3**	**2.9**	**8**
	F. MEASUREMENT Students will understand and demonstrate measurement skills. Students will be able to:	1. Use measurement tools and units appropriately and recognize limitations in the precision of the measurement tools.	F.9-12.1	2.0	3.0	2
		2. Derive and use formulas for area, surface area, and volume of many types of figures.	F.9-12.2	2.0	3.0	2
		Average DOK Ratings and Total Hits for Standard		**2.0**	**3.0**	**4**
	G. PATTERNS, RELATIONS, FUNCTIONS Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to:	1. Create a graph to represent a real-life situation and draw inferences from it.	G.9-12.1	2.0	2.7	3
		2. Translate and solve a real-life problem using symbolic language.	G.9-12.2	2.0	2.0	3
		3. Model phenomena using a variety of functions (linear, quadratic, exponential, trigonometric, etc.).	G.9-12.3	2.0	2.7	6
		4. Identify a variety of situations explained by the same type of function.	G.9-12.4	2.0	2.0	1
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.5**	**13**
	H. ALGEBRA CONCEPTS Students will understand and apply algebraic concepts. Students will be able to:	1. Use tables, graphs, and spreadsheets to interpret expressions, equations, and inequalities.	H.9-12.1	2.0	2.0	3
		2. Investigate concepts of variation by using equations, graphs, and data collection.	H.9-12.2	2.0	2.5	6
		3. Formulate and solve equations and inequalities.	H.9-12.3	2.0	2.1	12
		4. Analyze and explain situations using symbolic representations.	H.9-12.4	2.0	2.1	7
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.2**	**28**
	I. DISCRETE MATHEMATICS Students will understand and apply concepts in discrete mathematics. Students will be able to:	1. Use linear programming to find optimal solutions to a system.	I.9-12.1	2.0	2.5	2
		2. Use networks to find solutions to problems.	I.9-12.2	2.0	2.0	1
		3. Apply strategies from game theory to problem-solving situations.	I.9-12.3	2.0	2.0	1
		4. Use matrices as tools to interpret and solve problems.	I.9-12.4	2.0	2.0	1
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.2**	**5**

Categorical and Depth-of-Knowledge Alignment Ratings:

SAT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
	J. MATHEMATICAL REASONING Students will understand and apply concepts of mathematical reasoning. Students will be able to:	1. Analyze situations where more than one logical conclusion can be drawn from data presented.	J.9-12.1	3.0	2.7	3
		Average DOK Ratings and Total Hits for Standard		**3.0**	**2.7**	**3**
	K. MATHEMATICAL COMMUNICATION Students will reflect upon and clarify their understanding of mathematical ideas and relationships. Students will be able to:	1. Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument.	K.9-12.1	3.0	2.8	8
		2. Read mathematical presentations of topics within the Learning Results with understanding.	K.9-12.2	3.0		0
		Average DOK Ratings and Total Hits for Standard		**3.0**	**2.8**	**8**
	Average DOK Ratings and Total Hits for Grade Levels			**2.2**	**2.5**	**91**

Appendix D:

Categorical and Depth-of-Knowledge Alignment Ratings: PSAT/NMSQT to Maine Learning Results for Mathematics

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
Secondary Grades	A. NUMBERS AND NUMBER SENSE Students will understand and demonstrate a sense of what numbers mean and how they are used. Students will be able to:	1. Describe the structure of the real number system and identify its appropriate applications and limitations.	A.9-12.1	2.0	2.3	4
		2. Explain what complex numbers (real and imaginary) mean and describe some of their many uses.	A.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.3**	**4**
	B. COMPUTATION Students will understand and demonstrate computation skills. Students will be able to:	1. Use various techniques to approximate solutions, determine the reasonableness of answers, and justify the results.	B.9-12.1	3.0	2.4	9
		2. Explain operations with number systems other than base ten.	B.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.5**	**2.4**	**9**
	C. DATA ANALYSIS AND STATISTICS Students will understand and apply concepts of data analysis. Students will be able to:	1. Determine and evaluate the effect of variables on the results of data collection.	C.9-12.1	3.0	2.0	1
		2. Predict and draw conclusions from charts, tables, and graphs that summarize data from practical situations.	C.9-12.2	2.0	2.0	2
		3. Demonstrate an understanding of concepts of standard deviation and correlation and how they relate to data analysis.	C.9-12.3	2.0		0
		4. Demonstrate an understanding of the idea of random sampling and recognition of its role in statistical claims and designs for data collection.	C.9-12.4	1.0	3.0	1
		5. Revise studies to improve their validity (e.g., in terms of better sampling, better controls, or better data analysis techniques).	C.9-12.5	4.0		0
		Average DOK Ratings and Total Hits for Standard		**2.4**	**2.3**	**4**
	D. PROBABILITY Students will understand and apply concepts of probability. Students will be able to:	1. Find probability of compound events and make predictions by applying probability theory.	D.9-12.1	2.0	3.0	1
		2. Create and interpret probability distributions.	D.9-12.2	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.0**	**3.0**	**1**
	E. GEOMETRY Students will understand and apply concepts from geometry. Students will be able to:	1. Draw coordinate representations of geometric figures and their transformations.	E.9-12.1	2.0	2.0	2
		2. Use inductive and deductive reasoning to explore and determine the properties of and relationships among geometric figures.	E.9-12.2	3.0	2.4	5

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
		3. Apply trigonometry to problem situations involving triangles and periodic phenomena.	E.9-12.3	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.3**	**2.3**	**7**
	F. MEASUREMENT Students will understand and demonstrate measurement skills. Students will be able to:	1. Use measurement tools and units appropriately and recognize limitations in the precision of the measurement tools.	F.9-12.1	2.0	2.0	5
		2. Derive and use formulas for area, surface area, and volume of many types of figures.	F.9-12.2	2.0	2.5	2
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.1**	**7**
	G. PATTERNS, RELATIONS, FUNCTIONS Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to:	1. Create a graph to represent a real-life situation and draw inferences from it.	G.9-12.1	2.0	2.0	4
		2. Translate and solve a real-life problem using symbolic language.	G.9-12.2	2.0	2.0	2
		3. Model phenomena using a variety of functions (linear, quadratic, exponential, trigonometric, etc.).	G.9-12.3	2.0	2.3	3
		4. Identify a variety of situations explained by the same type of function.	G.9-12.4	2.0	2.0	1
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.1**	**10**
	H. ALGEBRA CONCEPTS Students will understand and apply algebraic concepts. Students will be able to:	1. Use tables, graphs, and spreadsheets to interpret expressions, equations, and inequalities.	H.9-12.1	2.0	2.0	1
		2. Investigate concepts of variation by using equations, graphs, and data collection.	H.9-12.2	2.0	2.3	3
		3. Formulate and solve equations and inequalities.	H.9-12.3	2.0	2.0	8
		4. Analyze and explain situations using symbolic representations.	H.9-12.4	2.0	2.1	7
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.1**	**19**
	I. DISCRETE MATHEMATICS Students will understand and apply concepts in discrete mathematics. Students will be able to:	1. Use linear programming to find optimal solutions to a system.	I.9-12.1	2.0		0
		2. Use networks to find solutions to problems.	I.9-12.2	2.0	2.0	1
		3. Apply strategies from game theory to problem-solving situations.	I.9-12.3	2.0	3.0	1
		4. Use matrices as tools to interpret and solve problems.	I.9-12.4	2.0		0
		Average DOK Ratings and Total Hits for Standard		**2.0**	**2.5**	**2**

Categorical and Depth-of-Knowledge Alignment Ratings:

PSAT/NMSQT to Maine Learning Results for Mathematics

Grade	Standard	Objective	Obj. ID	Obj. DOK	Average Item DOK	Total Hits
	J. MATHEMATICAL REASONING Students will understand and apply concepts of mathematical reasoning. Students will be able to:	1. Analyze situations where more than one logical conclusion can be drawn from data presented.	J.9-12.1	3.0	2.0	3
		Average DOK Ratings and Total Hits for Standard		**3.0**	**2.0**	**3**
	K. MATHEMATICAL COMMUNICATION Students will reflect upon and clarify their understanding of mathematical ideas and relationships. Students will be able to:	1. Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument.	K.9-12.1	3.0	2.5	11
		2. Read mathematical presentations of topics within the Learning Results with understanding.	K.9-12.2	3.0		0
		Average DOK Ratings and Total Hits for Standard		**3.0**	**2.5**	**11**
	Average DOK Ratings and Total Hits for Grade Levels			**2.2**	**2.2**	**77**

Appendix E:

Alignment of PSAT/NMSQT Skills to Maine Learning Results

PSAT/NMSQT® Score Report *Plus*
Skills and Suggestions for How to Improve
and
Comparison to Maine State Curriculum Standards

CRITICAL READING SKILLS - CR

CR1: Understanding main ideas in a reading passage
How to improve: Read the whole passage carefully and try to determine the author's overall message. Practice making distinctions between the main idea and supporting details.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.9, A.9-12.10, B.9-12.2, B.9-12.3, B.9-12.6, B.9-12.7, B.9-12.8, B.9-12.9, B.9-12.10, B.9-12.11, C.9-12.7, D.9-12.4, D.9-12.5

CR2: Understanding tone
How to improve: When reading, consider how an author's choice of words helps define his or her attitudes. Pay attention to the way in which tone conveys meaning in conversation and in the media.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, B.9-12.2, B.9-12.6, B.9-12.7, B.9-12.8, B.9-12.10, C.9-12.8, D.9-12.5

CR3: Comparing and contrasting ideas presented in two passages
How to improve: Read editorials that take opposing views on an issue. Look for differences and similarities in tone, point of view, and main idea.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, B.9-12.8, B.9-12.9, C.9-12.8, D.9-12.4, D.9-12.5

CR4: Understanding the use of examples
How to improve: Authors often include examples in their writing to communicate and support their ideas. Read different kinds of argumentative writing (editorials, criticism, personal essays) and pay attention to the way examples are used. State the point of the examples in your own words. Use examples in your own writing.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.9, A.9-12.10, B.9-12.8, B.9-12.9, C.9-12.8, D.9-12.4, D.9-12.5

CR5: Recognizing the purpose of various writing strategies
How to improve: Writers use a variety of tools to achieve their effects. While you read, look for such things as specific examples, quotations, striking images, and emotionally loaded words. Think about the connotations of specific words and why the author might have decided to use them.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.6, A.9-12.9, A.9-12.10, B.9-12.2, B.9-12.3, B.9-12.6, B.9-12.7, B.9-12.8, B.9-12.9, B.9-12.10, D.9-12.4, D.9-12.5

CR6: Applying ideas presented in a reading passage
How to improve: When you read, try to determine the author's ideas and assumptions and then think about how they might apply to new situations.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, B.9-12.8, B.9-12.9, C.9-12.8, D.9-12.4, D.9-12.5

CR7: Determining an author's purpose or perspective
How to improve: Authors write for a variety of purposes, such as to inform, to explain, or to convince. When you read, try to determine why the author wrote what he or she wrote.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, A.9-12.10, B.9-12.8, B.9-12.9, C.9-12.8, D.9-12.5

CR8: Making connections between information in different parts of a passage
How to improve: Work on figuring out the relationship between the material presented in one part of a reading passage and material presented in another part. Ask yourself, for example, how facts presented in the beginning of a magazine article relate to the conclusion.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.9, A.9-12.10, B.9-12.8, B.9-12.9, D.9-12.5

CR9: Distinguishing conflicting viewpoints
How to improve: When reading, practice summarizing main ideas and noting sentences that mark transition points. Learn to understand methods of persuasion and argumentation. Expand your reading to include argumentative writing, such as political commentary, philosophy, and criticism.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, A.9-12.10, B.9-12.8, B.9-12.9, C.9-12.7, C.9-12.8, D.9-12.5

CR10: Being thorough

How to improve: Don't just pick the first answer choice you see that looks tempting. Be sure to evaluate all the choices before you select your answer, just as you would read an entire paragraph rather than assume its meaning based only on the first sentence.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.1, A.9-12.3, A.9-12.4, A.9-12.5, A.9-12.6, A.9-12.9, B.9-12.2, B.9-12.6, B.9-12.7, B.9-12.8, B.9-12.10, C.9-12.8, D.9-12.5

CR11: Understanding difficult vocabulary

How to improve: Broaden your reading to include newspapers and magazines, as well as fiction and nonfiction from before the 1900s. Include reading material that is a bit outside your comfort zone. Improve your knowledge of word roots to help determine the meaning of unfamiliar words.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6, B.9-12.8

CR12: Understanding how negative words, suffixes, and prefixes affect sentences

How to improve: When reading, pay attention to the ways in which authors use negation. Look at how negative words (like "not" and "never"), prefixes (like "un" and "im"), and suffixes (like "less") affect the meaning of words and sentences.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6, B.9-12.8

CR13: Understanding complex sentences

How to improve: Ask your English teacher to recommend books that are a bit more challenging than those you're used to reading. Practice breaking down the sentences into their component parts to improve your comprehension. Learn how dependent clauses and verb phrases function in sentences.

Maine Standard(s) this skill complements:
No Identified Standards

CR14: Recognizing connections between ideas in a sentence

How to improve: Learn how connecting words (such as relative pronouns and conjunctions) establish the relationship between different parts of a sentence.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6, B.9-12.8

CR15: Recognizing words that signal contrasting ideas in a sentence

How to improve: Learn how certain words (such as "although," "but," "however," and "while") are used to signal a contrast between one part of a sentence and another.

Maine Standard(s) this skill complements:
No Identified Standards

CR16: Recognizing a definition when it is presented in a sentence
How to improve: Learn how such elements as appositives, subordination, and punctuation are used to define words in a sentence.

Maine Standard(s) this skill complements:
Reading Literature: B.9-12.8

CR17: Understanding sentences that deal with abstract ideas
How to improve: Broaden your reading to include newspaper editorials, political essays, and philosophical writings.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6, B.9-12.8

CR18: Understanding and using a word in an unusual context
How to improve: Work on using word definitions when choosing an answer. Try not to be confused by an unusual meaning of a term.

Maine Standard(s) this skill complements:
Reading Literature: B.9-12.8

CR19: Comprehending long sentences
How to improve: Practice reducing long sentences into small, understandable parts.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6

CR20: Choosing a correct answer based on the meaning of the entire sentence
How to improve: Make sure your answer choice fits the logic of the sentence as a whole. Don't choose an answer just because it sounds good when inserted in the blank.

Maine Standard(s) this skill complements:
No Identified Standards

CR21: Understanding sentences that deal with scientific ideas.
How to improve: Read magazine articles about scientific subjects to improve your comfort level in this area.

Maine Standard(s) this skill complements:
Reading Literature: A.9-12.6, B.9-12.8

MATHEMATICS SKILLS - M

M1: Using basic concepts and operations in arithmetic problem solving
How to improve: Practice solving problems involving positive and negative integers, fractions, decimals, ratio, percent, exponents, square roots, place value and digits. Also, practice solving problems involving odd and even integers, prime numbers, multiples, divisibility, and remainders.

Maine Standard(s) this skill complements:
A.9-12.1, A.9-12.2, B.9-12.1, B.9-12.2, C.9-12.2, G.9-12.1, G.9-12.2, K.9-12.2

M2: Understanding geometry and coordinate geometry
How to improve: Review geometry units in your textbook involving perimeter, area, volume, circumference, angles, lines, slope. Familiarize yourself with the formulas given at the beginning of math sections of the test.

Maine Standard(s) this skill complements:
E.9-12.1, E.9-12.2, E.9-12.3, F.9-12.1, F.9-12.2, K.9-12.1, K.9-12.2

M3: Dealing with probability, basic statistics, charts, and graphs
How to improve: Practice solving problems that involve basic probability, basic counting, and finding the average (arithmetic mean), median, and mode. Look for charts and graphs in newspapers and magazines, and practice interpreting the data in them.

Maine Standard(s) this skill complements:
C.9-12.1, C.9-12.2, C.9-12.3, C.9-12.4, C.9-12.5, D.9-12.1, D.9-12.2, G.9-12.1, H.9-12.1, H.9-12.2, K.9-12.2

M4: Creating either figures or algebraic equations, inequalities, or expressions to help solve problems
How to improve: Practice solving problems by drawing or visualizing figures to help you understand the problem. Practice developing equations, inequalities, or expressions from verbal descriptions, figures, or numerical data.

Maine Standard(s) this skill complements:
G.9-12.2, G.9-12.3, G.9-12.4, H.9-12.1, H.9-12.2, H.9-12.3, H.9-12.4, I.9-12.1, I.9-12.2, I.9-12.4

M5: Using basic algebraic concepts and operations to solve problems
How to improve: Review algebraic concepts and rules, such as those involving substitution, exponents, solving equations and inequalities, and combining algebraic expressions.

Maine Standard(s) this skill complements:
E.9-12.3, H.9-12.1, H.9-12.2, H.9-12.3, K.9-12.2

M6: Making connections among mathematical topics
How to improve: Practice problems that require combining skills acquired in different math courses, such as problems that use combinations of arithmetic, algebra, and geometry.

Maine Standard(s) this skill complements:
A.9-12.2, B.9-12.2, C.9-12.1, C.9-12.2, E.9-12.3, G.9-12.1, G.9-12.2, I.9-12.3, K.9-12.2

M7: Organizing and managing information to solve multistep problems
How to improve: Write down your steps in solving the problem. Monitor the steps as you go along, keeping in mind what the question is asking.

Maine Standard(s) this skill complements:
I.9-12.1

M8: Using logical reasoning
How to improve: Practice solving problems in which you must consider different possible cases. Make adjustments in your solution strategy when things aren't going as well as they should. It may help to look at the problem from different perspectives. Solving problems that require you to justify your answer may help you develop this skill.

Maine Standard(s) this skill complements:
B.9-12.1, C.9-12.1, C.9-12.2, C.9-12.4, C.9-12.5, E.9-12.2, I.9-12.2, J.9-12.1, K.9-12.1

M9: Recognizing patterns and equivalent forms
How to improve: Try recognizing a pattern by considering a simpler case. Try rewriting or rearranging the given expressions in a different form.

Maine Standard(s) this skill complements:
C.9-12.1, G.9-12.3, G.9-12.4, I.9-12.2, I.9-12.3, I.9-12.4, J.9-12.1

M10: Recognizing logical key words
How to improve: Pay attention to key words, such as "not," "at least," "at most," "must be," "could be," "possible," and "different." These words determine the meaning of the question and therefore must be understood to correctly solve the problem.

Maine Standard(s) this skill complements:
B.9-12.1, I.9-12.1, K.9-12.1, K.9-12.2

M11: Using answer choices to help solve the problem
How to improve: Looking at the answer choices may help you understand the problem. Sometimes the choices can help identify a strategy for solving the problem.

Maine Standard(s) this skill complements:
B.9-12.1

WRITING SKILLS-W

W1: Being precise and clear
How to improve: Learn to recognize sentence elements that are ambiguous and confusing. In your writing, choose words carefully and connect them for clear meaning.

Maine Standard(s) this skill complements:
Writing: E.9-12.3, F.9-12.1.a

W2: Following conventions in writing
How to improve: Review the chapters in a grammar book that cover grammatical conventions, such as word choice, use of noun and prepositional phrases, and sentence construction. Work with your teacher to become more familiar with the conventions of standard written English.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a, F.9-12.1.b, F.9-12.1.c, F.9-12.1.e

W3: Recognizing logical connections within sentences and passages
How to improve: Use the writing process to help you revise your draft essays. Work with classmates and teachers to clarify meaning in your writing.

Maine Standard(s) this skill complements:
Writing: E.9-12.3

W4: Using verbs correctly
How to improve: Make sure that you can identify the subject and verb of a sentence. Make sure you understand subject and verb agreement.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a

W5: Recognizing improper pronoun use
How to improve: Learn to understand the distinction between informal, spoken pronoun usage and standard written pronoun usage. Review the way you use pronouns in your own writing. Ask your teacher to help you identify and correct pronoun errors in your own writing.

Maine Standard(s) this skill complements:
Writing: E.9-12.3, F.9-12.1.a

W6: Understanding the structure of sentences with unfamiliar vocabulary
How to improve: Read material that contains unfamiliar vocabulary. Look for context clues to help you guess at the meaning of unfamiliar words as you read.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a, F.9-12.1.c, F.9-12.1.e

W7: Understanding complicated sentence structures
How to improve: Refer to a grammar book to identify various sentence patterns and their effective use. Vary the sentence patterns in your own writing.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a, F.9-12.1.b

W8: Understanding the structure of long sentences
How to improve: As you read, break long sentences into smaller units of meaning.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a

W9: Understanding the structure of sentences with abstract ideas
How to improve: Read newspapers, magazines, and books that deal with subjects such as politics, economics, history, or philosophy.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a

W10: Understanding the structure of sentences that relate to science or math
How to improve: Focus on how something is said as well as on what is said. Write about the things you are learning in math and science classes. Read articles in the science section of newspapers and magazines so that you will feel more comfortable with scientific or math content.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a, F.9-12.1.b

W11: Understanding the structure of sentences that relate to the arts
How to improve: Focus on how something is said as well as on what is said. Read articles in newspapers and magazines about the arts so that you will feel more comfortable with these subjects.

Maine Standard(s) this skill complements:
Writing: F.9-12.1.a

Appendix F:
Depth-of-Knowledge Scales by Subject Area[3]

Mathematics

Level 1: Recall

Level 1 includes the recall of information such as a fact, definition, term, or simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics a one-step, well-defined, and straight algorithmic procedure should be included at this lowest level. Other key words that signify a Level 1 activity include "identify," "recall," "recognize," "use," and "measure." Verbs such as "describe" and "explain" could be classified at different levels depending on what is to be described and explained.

Level 2: Skill/Concept

Level 2 includes the engagement of some mental processing beyond a habitual response. A Level 2 assessment item requires students to make some decisions as to how to approach the problem or activity, whereas a Level 1 item requires students to demonstrate a rote response, perform a well-known algorithm, follow a set procedure (like a recipe), or perform a clearly defined series of steps. Key words and phrases that generally distinguish a Level 2 item include "classify," "organize," "estimate," "make observations," "collect and display data," and "compare data." These actions imply more than one step. For example, to compare data may require first identifying characteristics of the objects and then grouping or ordering the objects.

Level 3: Strategic Thinking

Level 3 requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. In most instances, requiring students to explain their thinking is a Level 3 activity. Activities that require students to make conjectures are also at this level. The cognitive demands at Level 3 are complex and abstract. The complexity does not result from the fact that there are multiple answers, a possibility at both Levels 1 and 2, but because the task requires more demanding reasoning. An activity, however, that has more than one possible answer and requires

3. This material is based upon work supported by the National Science Foundation under contract number EHR 0233445 awarded to the University of Wisconsin–Madison and the Wisconsin Center for Education Research.

students to justify the response they give would most likely be a Level 3 activity. Other Level 3 activities include drawing conclusions from observations, citing evidence and developing a logical argument for concepts, explaining phenomena in terms of concepts, and using concepts to solve problems.

Level 4: Extended Thinking

Level 4 requires complex reasoning, planning, developing, and thinking—most likely over an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2 activity. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be a Level 4 activity. At Level 4, the cognitive demands of the task should be high and the work should be very complex. Students should be required to make several connections—relate ideas within the content area or among content areas—and have to select one approach among many alternatives on how the situation should be solved. Level 4 activities include designing and conducting experiments; making connections between a finding and related concepts and phenomena; combining and synthesizing ideas into new concepts; and critiquing experimental designs.

Reading

Level 1: Recall of Information

Level 1 requires students to receive or recite facts or to use simple skills or abilities. Oral reading that does not include analysis of the text as well as basic comprehension of a text is included. Items require only a shallow understanding of text presented and often consist of verbatim recall from text or simple understanding of a single word or phrase.

Level 2: Basic Reasoning

Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response; it requires both comprehension and subsequent processing of text or portions of text. Intersentence analysis of inference *is* required. Some important concepts are covered, but *not* in a complex way. Standards and items at this level may include words and phrases such as "summarize," "interpret," "infer," "classify," "organize," "collect," "display," "compare," and "determine whether fact or opinion." Literal main ideas are stressed. A Level 2 assessment item may require students to apply some of the skills and concepts that are covered at Level 1.

Level 3: Complex Reasoning

Deep knowledge becomes more of a focus at Level 3. Students are encouraged to go beyond the text; however, they are still required to show understanding of the ideas in the text. Students may be encouraged to explain, generalize, or connect ideas. Standards and items at Level 3 involve reasoning and planning. Students must be able to support their thinking. Items may involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge. Items may also involve more superficial connections between texts.

Level 4: Extended Reasoning

Higher-order thinking is central and knowledge is deep at Level 4. The standard or assessment item at this level will probably be an extended activity, with extended time provided. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. Students take information from at least one passage and are asked to apply this information to a new task. They may also be asked to develop hypotheses and perform complex analyses of the connections among texts.

Writing

Level 1: Recall of Information

Level 1 requires the student to write or recite simple facts. This writing or recitation does not include complex synthesis or analysis, only basic ideas. The students are engaged in listing ideas or words as in a brainstorming activity prior to written composition, are engaged in a simple spelling or vocabulary assessment, or are asked to write simple sentences. Students are expected to write and speak using standard English conventions. This includes using appropriate grammar, punctuation, capitalization, and spelling.

Level 2: Basic Reasoning

Level 2 requires some mental processing. At this level, students are engaged in first-draft writing or brief extemporaneous speaking for a limited number of purposes and audiences. Students are beginning to connect ideas using a simple organizational structure. For example, students may be engaged in note-taking, outlining, or simple summaries. Texts may be limited to one paragraph. Students demonstrate a basic understanding and appropriate use of such reference materials as a dictionary, thesaurus, or Web site.

Level 3: Complex Reasoning

Level 3 requires some higher-level mental processing. Students are engaged in developing

compositions that include multiple paragraphs. These compositions may include complex sentence structure and may demonstrate some synthesis and analysis. Students show awareness of their audience and purpose through focus, organization, and the use of appropriate compositional elements. The use of appropriate compositional elements includes such things as addressing chronological order in a narrative or including supporting facts and details in an informational report. At this stage, students are engaged in editing and revising to improve the quality of the composition.

Level 4: Extended Reasoning

Higher level thinking is central to Level 4. The standard at this level is a multiparagraph composition that demonstrates synthesis and analysis of complex ideas or themes. There is evidence of a deep awareness of purpose and audience. For example, informational papers include hypotheses and supporting evidence. Students are expected to create compositions that demonstrate a distinct voice and that stimulate the reader or listener to consider new perspectives on the addressed ideas and themes.